

AMENDMENTS IN THE CLAIMS:

1-40. (canceled)

41. (amended) A method for making a long superconductor, e.g. a tape or wire, by depositing at least one polycrystalline superconducting compound onto a metallic substrate or onto a buffer layer system of on said substrate, characterized by the following steps

- fabricating said metallic substrate or said buffer layer system to consist of or to contain on or close to its surface a microstructure of longitudinally oriented, long grains with a high aspect ratio, $a = L_{\text{par}}/L_{\text{per}}$ exceeding 1.5, and
- producing at least one percolation path along the length of said superconductor, each said path consisting of superconducting grains of said superconducting compound by epitaxially growing said superconducting compound grains on a preselected microstructure of on said substrate or on a top layer of said buffer layer system such that to produce a majority percolation path of the long superconducting grains is being aligned along the longitudinally extension of said superconductor, the majority of said superconducting grains in said path have and exhibiting a shape high aspect ratio such that their projection, being characterized by a length L_{par} parallel to the longitudinal extension of said superconductor and a length L_{per} perpendicular thereto, has an aspect ratio

$a = L_{\text{par}}/L_{\text{per}}$ exceeding 1.5, and the total volume V of said long superconducting grains being members of such one or more percolation paths exceeds exceeding 10% of the volume of said superconducting compound on said superconductor.

42. (amended) The method according to claim 41, wherein the buffer layer system is provided on the a substrate, the latter being of arbitrary structure, the top layer of said buffer layer system containing or consisting of a microstructure of longitudinally aligned grains with the high aspect ratio, $a = L_{\text{par}}/L_{\text{per}}$ exceeding 1.5, and wherein the superconducting grains are compound is grown on a preselected microstructure of the said top layer of said buffer layer system.

43. (canceled)

44. (amended) The method according to claim 41, wherein the microstructure of a surface of the substrate or of the top buffer layer is controlled by mechanical, atom-beam, or ion-beam treatment to produce the longitudinally oriented, long grains with the high aspect ratio.

45. (amended) The method according to claim ~~41~~ 44, wherein the microstructure of the surface of the substrate or of the top buffer layer is ~~controlled by polishing~~ treated to produce grooves in the said surface, said grooves having a depth of about 100nm, a length of about 100µm and a density of about 1/µm.

46. (amended) The method according to ~~any of the claim 41~~ 44, wherein the microstructure control steps are executed and/or repeated until an average angular misorientation of the produced long grains of the superconducting compound of less than 15° is achieved.

47. (amended) The method according to ~~any of the claim 41~~, wherein the superconducting compound is deposited from the vapor phase.

48. (amended) The method according to ~~any of the claim 41~~, wherein the deposition of the superconducting compound or is performed from a solution.

49. (canceled)

50. (previously presented) An at least partly superconducting object, in particular a wire or cable, comprising a superconductor fabricated according to claim 41.

51. (new) The method according to claim 42, wherein the buffer layer system consists of a single layer only.

52. (new) The method according to claim 41, wherein the aspect ratio $a > 4$.
53. (new) The method according to claim 41, wherein the total volume $V > 25\%$.
54. (new) The method according to claim 41, wherein the superconducting compound is a polycrystalline multilayer arrangement whose layers have different compositions.
55. (new) The method according to claim 54, wherein at least one layer of the superconducting compound is or contains a cuprate.
56. (new) The method according to claim 54, wherein at least one superconducting compound of the layers belongs to the $\text{ReBa}_2\text{Cu}_3\text{O}_{7-\delta}$ family, Re being a rare earth including La or Y.
57. (new) The method according to claim 41, wherein the grains are aligned such that the average misorientation angle is below 20° .
58. (new) The method according to claim 41, wherein the substrate is a metallic tape such as steel or a Ni alloy with a thickness in the range of 20 to 100 μm , whose surface grains are appropriately aligned.
59. (new) The method according to claim 42, wherein the buffer layer system comprises a plurality of sublayers such as $\text{CeO}_2/\text{YsZ}/\text{CeO}_2$.